

**AMENDMENTS TO THE DRAWINGS:**

A Replacement Sheet containing Figures 1 and 2 is attached to this response.

## REMARKS

Entry of the foregoing and reexamination and reconsideration of the subject application, as amended, pursuant to and consistent with 37 C.F.R. § 112, are respectfully requested in light of the following remarks.

Claims 8-15 are pending in this application.

Claim 8 has been amended to delete the recitation of "(New)" within the claim language and to recite the recovery of the intermediate fraction is carried out using one of two procedures. Support for this amendment is found on page 4, lines 6-9 of the specification. Claims 10 and 11 have been amended to be in independent form and to incorporate all of the elements from the previous version of claim 8, from which they previously depended.

The specification has been amended to insert a brief description of the drawings. A description of the drawings was previously found on page 5, lines 31-35, but did not include a heading and was not in the proper format. The specification has also been amended to refer to the brief description of the drawings and to delete the description of Figs. 1 and 2, which are now provided in the "Brief Description of the Drawings" section. Page 8, lines 6-17 of the specification has been amended to recite a bottom fraction 17 and an intermediate fraction 19. The words "bottom" and "intermediate" were added to distinguish these fractions from each other. Support for the use of these terms is found in the paragraph in which they are used, i.e. "recovered at the bottom of column 14"; and "by withdrawing from an intermediate plate" and in figure 2.

A sheet of replacement drawings are attached to this response. Figure 1 has been amended to indicate that it is prior art. Figure 2 has been amended to enclose column 14, which inadvertently contained two blank openings, and to adjust the leader lines to more clearly point to the location being indicated.

No new matter has been added in making these amendments.

### Abstract

The Office Action indicates that the application does not contain an abstract as required by 37 CFR 1.72(b). The Office Action further indicates that an abstract on a separate sheet is required and the abstract in the PCT does not suffice.

An abstract was filed on a separate sheet of paper on January 20, 2006. A copy of this abstract is attached to his response. The PAIR system indicates that three abstracts were entered into the system on January 20, 2006:

Mail Room Date	Code	Document Description	Page Count	Status
04-16-2006	CTNF	Non-Final Rejection	2	<input type="checkbox"/>
04-16-2006	CTNF	Non-Final Rejection	6	<input type="checkbox"/>
04-16-2006	OSZ	List of references cited by examiner	1	<input type="checkbox"/>
04-16-2006	DBI	Abstracts of Invention	1	<input type="checkbox"/>
05-09-2006	MOO	Notice of Opposition	2	<input type="checkbox"/>
01-20-2006	TSNA	Transmittal of Invention	3	<input type="checkbox"/>
01-20-2006	13GA	Authorization for Extension of Time of Filing	3	<input type="checkbox"/>
01-20-2006	SPEC	Specification	9	<input type="checkbox"/>
01-20-2006	CLM	Claims	2	<input type="checkbox"/>
01-20-2006	ABST	Abstract ← 1	1	<input type="checkbox"/>
01-20-2006	DRW	Drawings (not labeled and white line drawing)	1	<input type="checkbox"/>
01-20-2006	WFEE	Fee Worksheet (PTO-06)	1	<input type="checkbox"/>
01-20-2006	OATH	Oath of Invention	2	<input type="checkbox"/>
01-20-2006	APE	Declaration of Inventor	1	<input type="checkbox"/>
01-20-2006	SPEC	Specification	2	<input type="checkbox"/>
01-20-2006	CLM	Claims	2	<input type="checkbox"/>
01-20-2006	REIM	Reimbursement Statement	1	<input type="checkbox"/>
01-20-2006	ABST	Abstract ← 2	1	<input type="checkbox"/>
01-20-2006	71P	Documents submitted with 71P Application	13	<input type="checkbox"/>
01-20-2006	71P	Documents submitted with 71P Application	1	<input type="checkbox"/>
01-20-2006	71P	Documents submitted with 71P Application	13	<input type="checkbox"/>
01-20-2006	ABST	Abstract ← 3	1	<input type="checkbox"/>
01-20-2006	FRPR	Form of Request for Priority	13	<input type="checkbox"/>
01-20-2006	IMS	International Preliminary Report	1	<input type="checkbox"/>
01-20-2006	WFEE	Fee Worksheet (PTO-06)	1	<input type="checkbox"/>
01-20-2006	WCLM	Claims Worksheet (PTO-06)	1	<input type="checkbox"/>
01-20-2006	WFEE	Fee Worksheet (PTO-06)	1	<input type="checkbox"/>
01-20-2006	WCLM	Claims Worksheet (PTO-06)	1	<input type="checkbox"/>

Entry 1 contains the Abstract on a single page. Entries 2 and 3 are the abstract in the PCT. Applicants therefore believe that the application contains an abstract as required, and request the Examiner withdraw this objection.

The Office Action noted that the listing of the references in the International Search Report were not considered to be an information disclosure statement complying with 37 CFR 1.98.

An information disclosure statement is being with the response. Applicants therefore request the Examiner withdraw this objection.

The Office Action objected to the disclosure because a reference to and a brief description of the drawings is missing from the specification.

Applicants note that although a description of the drawings was provided in the specification on page 5, line 31-35, the specification did not contain a header and a separate description of the drawings. The specification has been amended to include a reference to and a brief description of the drawings. Applicants therefore request the Examiner withdraw this objection.

**35 U.S.C. §112 first and second paragraph Rejections**

Claims 8-15 have been rejected under 35 U.S.C. §112, first and second paragraph, as the claimed invention is not described in such full, clear, concise and exact terms as to enable any person skilled in the art to make and use the invention, and fails to comply with the written description requirement.

The Office Action states that the term "comprising" in claim 8, line 3 appears to be at odds with, and is broadening of, the term "consists in" recited on page 3, line 22.

The term "consists in" is part of the phrase "characterized in that it consists in." The application is based on a French PCT application. The phrase "characterized in that it consists in" is a phrase used in European patent practice to describe the equivalent of "comprising" in U.S. patent practice. The term, as used in European patent practice does not mean "consisting of", as used in U.S. patent practice. As such, claim 8 is not a broadening of the specification.

**35 U.S.C. §112 second paragraph Rejection**

Claims 8-15 have been rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The Office Action states that it is unclear what constitutes the claimed lower boiling compounds, the intermediate fraction and the higher boiling point products as they are not specified in the claims.

The specification teaches the three fractions are separated based on the boiling points of the compounds present. The claims recite that: (1) compounds with a lower boiling point than that of the dinitriles are recovered at the top of the distillation column; and (2) products with a higher boiling point than that of the dinitriles are recovered at the bottom of the distillation column. One of ordinary skill in the art would recognize distillation is distillation towers, or columns, separates compounds based on their relative boiling points.

Industrial distillation is typically performed in large, vertical cylindrical columns known as "distillation or fractionation towers" or "distillation columns" with diameters ranging from about 65 centimeters to 6 meters and heights ranging from about 6 meters to 60 meters or more. The distillation towers have liquid outlets at intervals up the column which allow for the withdrawal of different *fractions* or products having different boiling points or boiling ranges. The "lightest" products (those with the lowest boiling point) exit from the top of the columns and the "heaviest" products (those with the highest boiling point) exit from the bottom of the column. (See [http://en.wikipedia.org/wiki/Fractional\\_distillation](http://en.wikipedia.org/wiki/Fractional_distillation))

One of ordinary skill in the art would also recognize that the exact compounds that will be found in each of these fractions are dependent upon the specific dinitrile being produced. For example, in the production of adiponitrile (which has a boiling point of 295°C, see: <http://en.wikipedia.org/wiki/Adiponitrile>), 4-pentenitrile (which has a lower boiling point of 147-148°C, see: <http://msds.chem.ox.ac.uk/PE/4-pentenitrile.html>) would be recovered in the column top. One of ordinary skill in the art would recognize that the description of the material recovered in the column top and the column bottom, based on their boiling point relative to the boiling point of the dinitriles recovered in the intermediate fraction, particularly points out and distinctly claims the subject matter which applicant regards as the invention.

Applicants therefore request that this rejection be withdrawn.

**Rejection of Claims under 35 U.S.C. §103(a)**

Claims 8, 9 and 12-15 have been rejected under 35 U.S.C. §103(a) as unpatentable over Bassler et al. (US 6,139,693) with or without Benzie et al. (US 4,230,634).

Bassler teaches a method for recovering hexamethylenediamine from a mixture (II) that includes: (I) hexamethylenediamine, (III) hexamethyleneimine, (IV) a compound selected from 2-aminomethylcyclopentylamine and 1,2-diaminocyclohexane, (V) an imine, and (VI) adiponitrile and 6-aminocapronitrile. Bassler teaches distilling the mixture (II) to obtain three fractions including a high boiling fraction comprising (V) an imine, and (VI) adiponitrile and 6-aminocapronitrile. Bassler does not teach separating (VI) into the individual components adiponitrile and 6-aminocapronitrile.

Benzie teaches a method of manufacturing organic nitriles. Benzie teaches separating mononitriles (3-pentenitrile) formed in the reaction process from the reaction medium by distillation. (See col. 2, lines 43-52). The Office Action appears to have mistakenly indicated that "Benzie suggests distillation to achieve the desired separation/purification of said nitriles containing product. See e.g., col. 2, lines 43-47)" [see page 5 of Office Action]. The cited section of Benzie teaches separating the mononitrile from the reaction mixture by distillation but does not teach separating the dinitrile, and especially does not teaching separating the dinitrile by the specific steps required in the claims.

Applicants respectfully submit claims 8, 9 and 12-15 are not obvious over Bassler and Benzie and all claims are allowable.

To establish a *prima facie* case of obviousness, three basic criteria must be met. (MPEP 2143) First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

To establish a *prima facie* case of obviousness, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. The Office Action indicates that the claims are rejected as being unpatentable over Bassler with or without Benzie. There is no suggestion or motivation in Bassler to separate dinitriles from the impurities formed using the claimed methods. While Bassler teaches methods of separating the lower boiling fractions into other fractions, Bassler is silent on separating the high boiling fraction comprising (V) an imine, and (VI) adiponitrile and 6-aminocapronitrile into an intermediate fraction comprising the dinitriles. Benzie teaches hydrogenating adiponitrile to hexamethylene diamine but does not provide any suggestion or motivation to obtain purified adiponitrile. Therefore there is no suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings to obtain the methods in the instant claims.

To establish a *prima facie* case of obviousness, there must be a reasonable expectation of success. There is no reasonable expectation of success, based on the teachings in the cited prior art to obtain a process for the manufacture and



separation of dinitriles from a medium originating from a hydrocyanation of unsaturated mononitriles using the steps recited in the claims. There cannot be a reasonable expectation of success in developing a method where required elements of the method are not taught or suggested in the prior art. Neither Bassler nor Benzie teach or suggest step (c): recovering an intermediate fraction comprising the dinitriles from a theoretical plate situated in a lower part of the column with respect to a feed point of the medium comprising the dinitriles. Neither Bassler nor Benzie teach a separation where the dinitrile is separated in an intermediate fraction of a distillation column. Nor do they teach or suggest recovering the dinitrile from a theoretical plate situated in a lower part of the column with respect to a feed point of the medium comprising the dinitriles. Bassler and Benzie also do not teach or suggest that the recovery of the intermediate fraction is carried out either without reflux or with reflux with a reflux ratio of between 1 and 6% by weight of the intermediate fraction. Bassler teaches recovering a high boiling fraction comprising (V) an imine, and (VI) adiponitrile and 6-aminocapronitrile as the bottom product (a3) in a distillation, not as an intermediate fraction as required by the claims. Therefore there would not be a reasonable expectation of success in producing the methods for the manufacture and separation of dinitriles from a medium originating from a hydrocyanation of unsaturated mononitriles as required in the instant claims.

To establish a *prima facie* case of obviousness, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Neither Bassler nor Benzie teach or suggest step (c): recovering an intermediate fraction comprising the dinitriles from a theoretical plate situated in a lower part of the column with respect to a feed point of the medium comprising the dinitriles. Neither Bassler

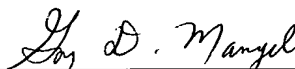
nor Benzie teach a separation where the dinitrile is separated in an intermediate fraction of a distillation column. Nor do they teach or suggest recovering the dinitrile from a theoretical plate situated in a lower part of the column with respect to a feed point of the medium comprising the dinitriles. Bassler and Benzie also do not teach or suggest that the recovery of the intermediate fraction is carried out either without reflux or with reflux with a reflux ratio of between 1 and 6% by weight of the intermediate fraction. Therefore all of the limitations of these claims are not taught by Bassler or Benzie.

For at least the reasons stated above, Claims 8, 9 and 12-15 are not obvious over Bassler with or without Benzie. Applicants therefore request the withdrawal of this rejection.

Respectfully submitted,

BUCHANAN INGERSOLL & ROONEY PC

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By:   
Gary D Mangels  
Registration No. 55424

P.O. Box 1404  
Alexandria, VA 22313-1404  
703 836 6620

Attachment: Copy of Abstract filed on 1/20/2006  
Replacement Drawing Sheet